Software Requirements Specification

<Milestone 1>

Version 1.0 approved

Prepared by <PO8-07>

<RMIT>

<8/08/2024>

Table of Contents

Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The aim of this document is to provide a detailed description of the VetCare System. It will provide detail on the user interface, features and what the system will do. This document is intended for both the stakeholders and the developers of the system and will be proposed to the designated RMIT tutor for its approval.

1.2 Document Conventions

Font and Highlighting

Headings: Font arial, size 17, bold

Body Text: font arial, size 11

References: External documents, standards, and resources are referenced using APA style.

1.3 Intended Audience and Reading Suggestions

This document is intended for the developers of the VetCare app and the stakeholders at RMIT (e.g tutor). The developers will use this document for overall descriptions of functional and non-functional requirements, system architecture. Reading suggestions for them is to begin with introduction then proceed to systems architecture and requirements. As for the stakeholders, the focus area is the product scope, functional requirements, nonfunctional requirements and user interface design. Reading suggestions start with the Introduction and Product Scope, then review the Functional and Nonfunctional Requirements to understand the system's capabilities and limitations.

1.4 Product Scope

VetCare – Online Vet clinic management system is designed to provide a comprehensive and user-friendly platform for managing various aspects of veterinary care. The main objective is to offer pet owners a seamless experience in managing their pets' health needs. This includes appointment scheduling, accessing medical records and handling prescriptions all within one system. The business strategies include a customer focused solution which aims to integrate multiple veterinary services into a single platform. This can potentially lead to increasing the market reach and profitability of veterinary clinics.

1.5 References

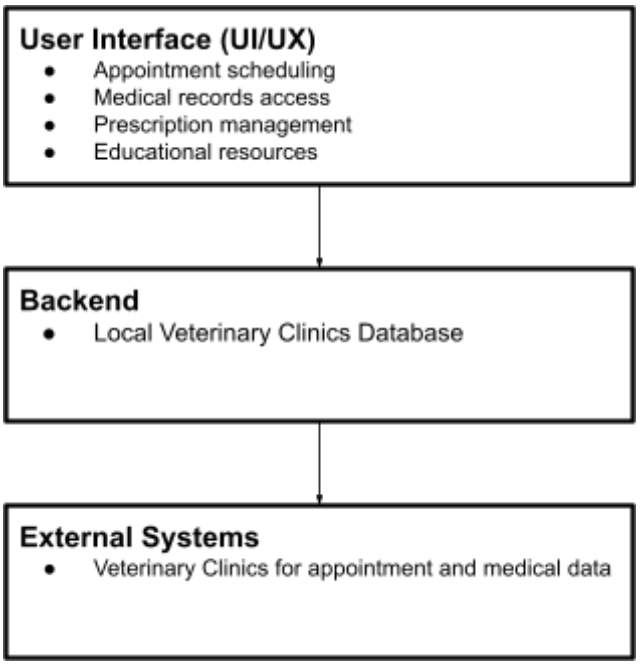
https://docs.google.com/document/d/1fhMWb6V4eARAYrEr2iYMp9vbfu11MxxCi8IH4FOIvWc/edit?usp=sharing

https://docs.google.com/document/d/1P2JOX7pmJmrtroCz1ofQyQvvNe3__C80ZhHy7FrdauY/edit?usp=sharing

2. Overall Description

2.1 Product Perspective

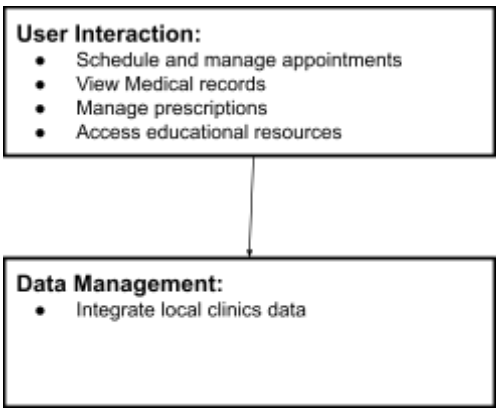
VetCare is a new, self-contained application designed to offer comprehensive online management veterinary care. The system intends to integrate numerous local veterinary clinics to provide users with a platform where they can access and manage pet-related services. The software will interact with external systems to fetch real-time data on clinic availability as well as pricing and other information.



2.2 Product Functions

Major Functions of the VetCare system include:

- Appointment Scheduling: booking, rescheduling and cancelling appointments
- Medical Records Access: view and manage pets medical history including vaccinations or treatments.
- Prescription management: Request prescription refills and manage medication details
- Educational Resources: Access a library of pet care articles, videos and guides.



2.3 User Classes and Characteristics

User Classes	Frequency of Use	Functions used	Characteristics
Pet Owners	Regularly	• Appointment scheduling • Access medical records • Access educational resources • Prescription management	• Basic technical skills • Primary users of the application
Veterinary Clinics	Daily	• Manage appointments • Update medical records	• Professional technical skills • High security privileges
Administrators	Daily	• System management • User management • Integration of data	• High technical expertise • Full access to the systems functions

2.4 Operating Environment

Hardware Platform: The VetCare Application will operate on devices such as computers and smartphones

Operating System: The VetCare application will be compatible with Windows, macOS and Linux.

Software Components:

- Database: MySQL
- Web framework: Spring Boot
- Build tool: Maven
- Code Repository: Github

2.5 Design and Implementation Constraints

Hardware limitations: Must use a scalable architecture to handle expansion and varying timing and memory requirements.

Interfaces: Integration with external clinics and databases, API's

Technologies: Java, Spring Boot

Security: Account and password management

2.6 User Documentation

User Manual:

Guide on VetCare Application:

Major features include:

Appointment Scheduling:

The appointment scheduling feature in the application will work to guide users on how they can book an appointment, reschedule an appointment or cancel an appointment they have made. This is done through a series of instructions or screenshots made available to the user so they can understand how to navigate through the VetCare websites' features including the appointment calendar, selecting a vet and finalising an appointment.

Medical Records Access:

The medical records access feature will coach users how they can view and manage their pets medical history such as vaccination records and treatment plans and also guides them on how they can download and share their medical records with other veterinarians.

Prescription Management:

The prescription management feature of the website will cover how users can request and manage prescriptions and access information of their pet's medications. It also guides users how to track their prescription orders and receive alerts and notifications.

Education Resources:

The education resources section will provide instructions on how to look through a large library of articles, videos and guides on pet care and wellness. It will demonstrate how to search for specific topics and filter resources by category and also save favorites.

The user manual will be available in a web-based and PDF format to allow more accessibility to users across different platforms.

Online Help System:

The online help system will be incorporated into the VetCare application which will aim to give specific support to users. Users can ask for help with certain topics they find confusing by navigating to the help section and clicking on a help icon in the website. The online help system will manage all the major features of the application and provide fast paced support through searchable topics and FAQs.

Tutorials:

Tutorials will be available to support users with getting used to using and navigating through the VetCare application. They will guide users through tasks that they will be frequently carrying out while using the application including booking an appointment or accessing medical records for their pets. The tutorials will include interactive features that allow users to practise these tasks in a simulated environment.

- VetCare introduction: A basic tutorial that introduces users to the interface and navigation of the website, this lets them get more familiar with the website.
- Scheduling an appointment: A comprehensive guide that includes clear instructions on how to book, reschedule and cancel their appointments.
- Managing medical records: A tutorial that shows users how to access, download and share their medical records with other people.
- Prescription management: A tutorial instructing users on requesting and managing prescriptions.
- Exploring education resources: A tutorial showing how to use pet care library resources.

Delivery Formats and Standards

Formats: Delivery of user documentation will be made through a web-based format accessible in the VetCare application. PDF versions of the documentation can be downloaded as well and video tutorials can be watched on the VetCare online help system.

Standards: User documentation will strictly adhere to the relevant industry standards where referencing will be used APA style for documents, standards and other resources. The layout will be designed clearly and be simple to understand and use. This is done through good use of fonts, headings and bullet points for readability.

2.7 Assumptions and Dependencies

Assumptions include:

- Users will have devices where the VetCare application can run on such as smartphones and computers
- Users of the VetCare application have basic technical skills to operate the website.
- Users have stable internet connection so they can access and use the VetCare application.
- API access for real-time data retrieval will be provided by external systems such as veterinary clinics and other systems.
- Compliance with Australian laws, regulations and standards especially regarding medical records and data privacy topics.

Dependencies include:

- Real-time clinic data and prescription information will be accessible through third-party API integration.
- The MySQL database will ensure availability and reliability for data storage and retrieval.
- The application relies on ongoing access to a secure hosting environment for deployment and execution.
- The application will rely on external libraries and frameworks such as Spring Boot, Thymeleaf and maven to use for its development.

3. External Interface Requirements

3.1 User Interfaces

The VetCare application will focus on providing a user-friendly and good use of GUI standards across all supported platforms and devices such as mobile and desktop.

The main features of the user interface will include the following:

Home Page:

A dashboard displaying quick access to the major features of the application like appointment scheduling, medical records, and prescription management for pets.

Appointment Scheduling:

An interface that has a calendar in the application that allows users to book appointments, reschedule, or cancel appointments. Users can view available slots in the calendar and select their preferred veterinarian, and receive confirmation notifications.

Medical Records:

A private section of the application where users are able to view and download their pet's medical history, vaccination records, and treatment plans. The interface will include options for filtering records by date or type.

Prescription Management:

The interface for requesting prescription refills, viewing medication details, and managing orders. Users will receive notifications for prescription statuses and delivery updates.

Educational Resources:

A library interface with search and filter options for accessing articles, videos, and guides on pet care. Content will be categorised for easy navigation.

3.2 Hardware Interfaces

The hardware interfaces includes the following aspects:

User Devices:

The VetCare application will support smartphones, computers and other devices which require access to the internet and the capability to run on newer web browsers.

Server Hardware:

For the server hardware, servers hosting the VetCare application must have the ability to handle multiple connections that run at the same time and securely store large volumes of data and as user traffic increases so does the server hardware to meet the growing user demand.

3.3 Software Interfaces

The software components include the following:

Web Browsers:

Browsers including Chrome, Firefox, Edge and Safari will be supported by the VetCare application in order to provide consistent user experience across platforms.

Operating Systems:

VetCare application will have compatibility with the main operating systems including macOS, Linux and Windows.

Database:

For efficient data storage and retrieval, the application will be using the MySQL database system which allows the interface to manage user data, medical records and appointment schedules.

APIs:

VetCare will connect with external systems via APIs to fetch real-time data on clinic availability, pricing and prescription details and will use standard communication protocols such as REST over HTTP.

Email Service:

Notifications and reminders will be sent to users through an integration between the VetCare application and email services.

3.4 Communications Interfaces

The application will include the following communication interfaces:

HTTP/HTTPS:

VetCare application will have communication with other external services and user devices using HTTP and HTTPS on the internet. HTTPS will securely encrypt data such as medical records and payment details.

Email:

Utilising SMTP or Simple Mail Transfer Protocol to send emails that consist of appointment confirmations, prescription notifications and user alerts.

WebSockets:

WebSockets can be used by the app to get real-time updates on appointment availability and notifications. It can also ensure continuous communication between the server and client.

API Endpoints:

For data exchanging with external systems, VetCare will use REST API endpoints, following the relevant API practices for formatting requests and response, authentication and error handling.

4. Nonfunctional Requirements

4.1 Performance Requirements

- **Scalability –** The Vet Care System should be able to handle growing amounts of user and data traffic without sacrificing performance and resources e.g. it should be able to handle at least 100 users concurrently with peaks of at least 500.

- **Availability –** The Vet Care System should be available in multiple locations and platforms e.g. mobile, laptop etc. with minimal downtime. Any scheduled maintenance should occur during off-peak hours to minimise user disruption and poor user-experience

- **Reliability –** The Vet Care System should consistently perform as expected allowing for all user actions to be executed during all operating hours

- **Response Time -** The Vet Care System should load critical functionalities such as loading dashboards, main pages, appointment schedules and more within 5 seconds under normal operating conditions. When loading higher system operations such as loading complete medical records, users should wait no longer than 10 seconds.

4.2 Safety Requirements

- **Data Backups –** Daily Data backups should be performed to minimise data loss of critical information ensuring that data of from at least a 24-hour period is kept safe. Data backups should be maintained and checked to ensure data integrity.

- **Error handling –** In case of any errors the vet care systems should perform error handlers such as providing informative feedback to users when there are errors and

log the error for future analysis and fixes. Feedback should be satisfactory in explaining errors, to ensure the system can be utilised more effectively. Any failures should be minimised to ensure reduced potentials of data loss.

4.3 Security Requirements

- **Access control –** Different user roles and identifications should be clearly defined with predetermined sets of rules and authority. Users should only be able to access functionalities and data based on their roles and privileges where role-based access control is prioritised. Ensures that data is not misused or misplaced.

- **Authentication –** All users should be authenticated too ensure data integrity through systems such as two factor authentication. All user sessions should also be expired after periods of inactivity to minimise usage of system resources and risks of unauthorised access.

- **Data management & security/encryption –** All data and predominantly sensitive data should be properly and safely stored to ensure minimal risks of corruption or loss. Sensitive data including payment details, medical records and other personal information should be encrypted to ensure only authorised users can access, reducing risks of data theft.

- **Auditing of security and privacy breaches –** All system performances and attacks should be audited to ensure that data security systems are working as expected and that any future attacks can be minimised or defender against.

- **Compliance –** Security requirements that are implemented to comply with any data security and legal laws such as the Australian Privacy Act which regard the integrity of personal information

4.4 Software Quality Attributes

- **Usability (UI) –** The system should have an intuitive, user friendly and consistent interface throughout the whole platform to ensure users can utilise the system with minimal effort

- **Testability –** The systems should be able to be tested to reach certain goals and functions. Usability tests should be conducted with primary representative users to ensure adequate and appropriate feedback

- **Maintainability** – The system should only utilise an appropriate amount of resources and all code should be well documented and structured for easy updates and maintenance. All code should be up to date and properly tested for functionality.

- **Adaptability/Portability -** The system should be able to operate on multiple different platforms to adhere to different users and requirements. The system should provide seamless integration and functionality for different operating systems (windows or Linux) and devices (phone or laptop)

- **Interoperability –** The system should be able to easily integrate third-party API and any extra add on features to the platform to enhance user experience

4.5 Business Rules

- **User Roles –**
    - Only authorised staff can access sensitive information and modify them such as user pet medical records.
    - Authorised staff such as administrators are able to view all booking schedules and payments for appropriating appointment handling.
    - Users can view only view and download medical records but not alter them to ensure complete data integrity and correctness

- **Appointment Scheduling –**
    - To place any appointment bookings users must be logged in
    - Rescheduling appointments within 24 hours of their appointment being held, with incur an additional charge of $20
    - Cancelling appointments within 24 hours of their appointment being held, with incur an additional charge of $20

- **Prescription –**
    - All prescriptions provided much be verified by the staff or an official veterinarian
    - Prescription refills should only be approved by veterinarian
    - Prescription history is only accessible by official staff and the representative user

- **Library of resources –**
    - All educational resources must be verified by educational institutions and by a certified veterinary before being published
    - All resources must stay on the platform and not be reused for copy right legalities unless stated otherwise

5. Other Requirements

- **Legal Requirements**
    - Medical administration and prescriptions should adhere to Australian medical and safety laws
    - Personal information and its integrity should follow the Australian Privacy laws such as the Privacy and Data Protection Act

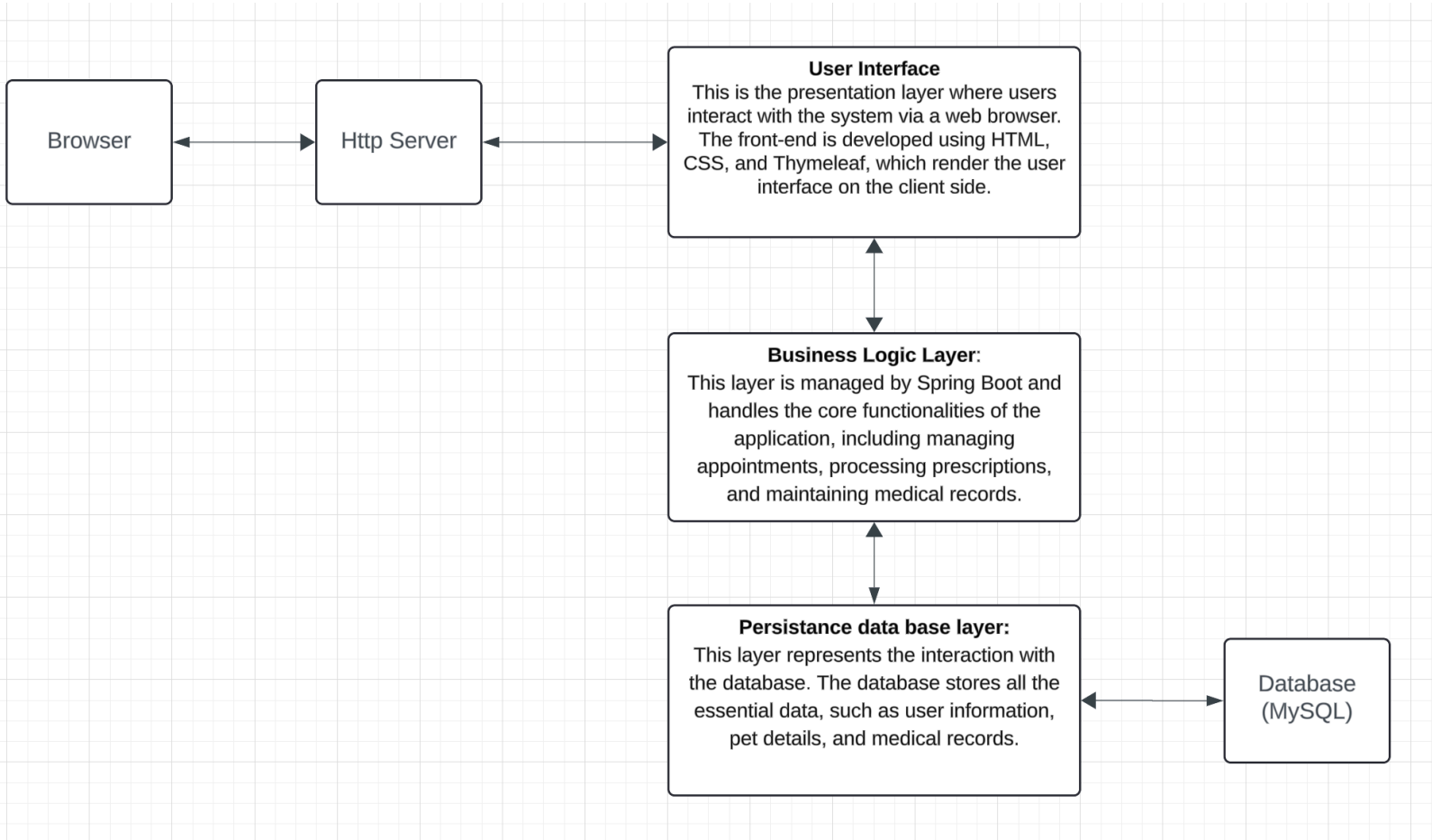
- **Internationalisation**
    - Locale formatting should be adjusted to users, this includes date, time and currency. E.g. DD/MM/YYYY could adjust to MM/DD/YYYY and AUD currency can adjust to USD

6. System Architecture

The VetCare system is designed using a Monolithic Layered Architecture. This approach is chosen for its simplicity, ease of deployment, and suitability for the scope of the application. The architecture is designed to ensure clear separation of concerns, maintainability, and scalability.

6.1 Architecture Overview

<Important, expensive, critical, large scale or risky architecture decisions including rationales.>



6.2 Architectural Decisions

Monolithic Architecture:

- **Rationale**: We selected a monolithic architecture for its simple approach, where all components are built and deployed as a single codebase. This architecture is easier to manage and deploy, which we think is suitable for the VetCare system's initial development phase which will involve implementing multiple features such as appointment scheduling, medical record access and prescription management.
- **Risk**: The main risk with monolithic architecture is potential challenges in scaling and maintaining the system as it grows.
- **Benefits:** Easier to develop in the early stages which these tasks mainly involve in the structure of the VetCare system.

Layered Design:

- **Decision:** The application will be layered like so: User Interface, Business Logic Layer, and Persistence Database Layer.
- **Rationale**: The layered approach ensures that each layer has a specific responsibility, making the system easier to maintain. This separation of these layers allows for clear boundaries between the UI, business logic, and data access, reducing the complexity of the system.
- **Risk**: Potential changes to one layer can impact other layers causing confusion.
- **Impact:** Clear separation of layers allows for easier modifications to each individual layer and does not affect the whole system.

Technology Choices:

- **Spring Boot**: Chosen for managing the business logic due to its robustness and extensive features
- **Thymeleaf**: Selected for rendering the user interface, offering tight integration with Spring Boot and it is capable of processing HTML and CSS
- **MySQL Database**: Used for the persistence database layer due to its reliability and wide support for java.

Scalability and Future Considerations:

- Whilst the monolithic layered architecture approach is more suited towards early development and current needs, the architecture we've chosen considers future scalability and allows for expansion without significant rework on the system. This should allow for a smooth transition as the user base and features grow.

7. User Interface Design

<Provide a high-level view of your UI design>

Figure 1.0 - Homepage that displays accessible navbar links, upcoming appointments, and general introductory videos and messages to the website.

Figure 1.1 - By clicking on the ‘person’ icon in the top right corner, a user will be directed to the “Login” page. This is where they can login to their own account, with their email and password, if they have made one.

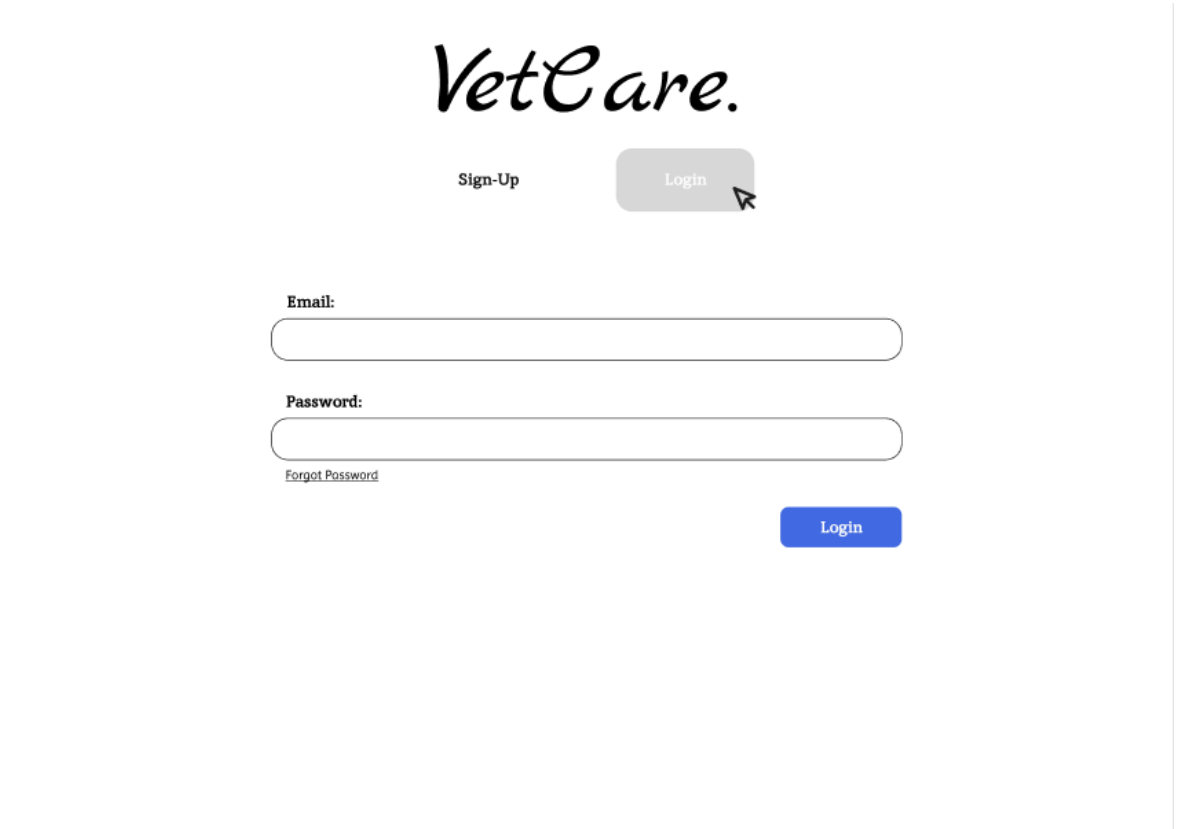


Figure 1.2 - If a user does not have an account, they can click the “Sign-Up” button where they will be redirected to a form to sign up for an account with the following credentials required: Name, Email and Password.

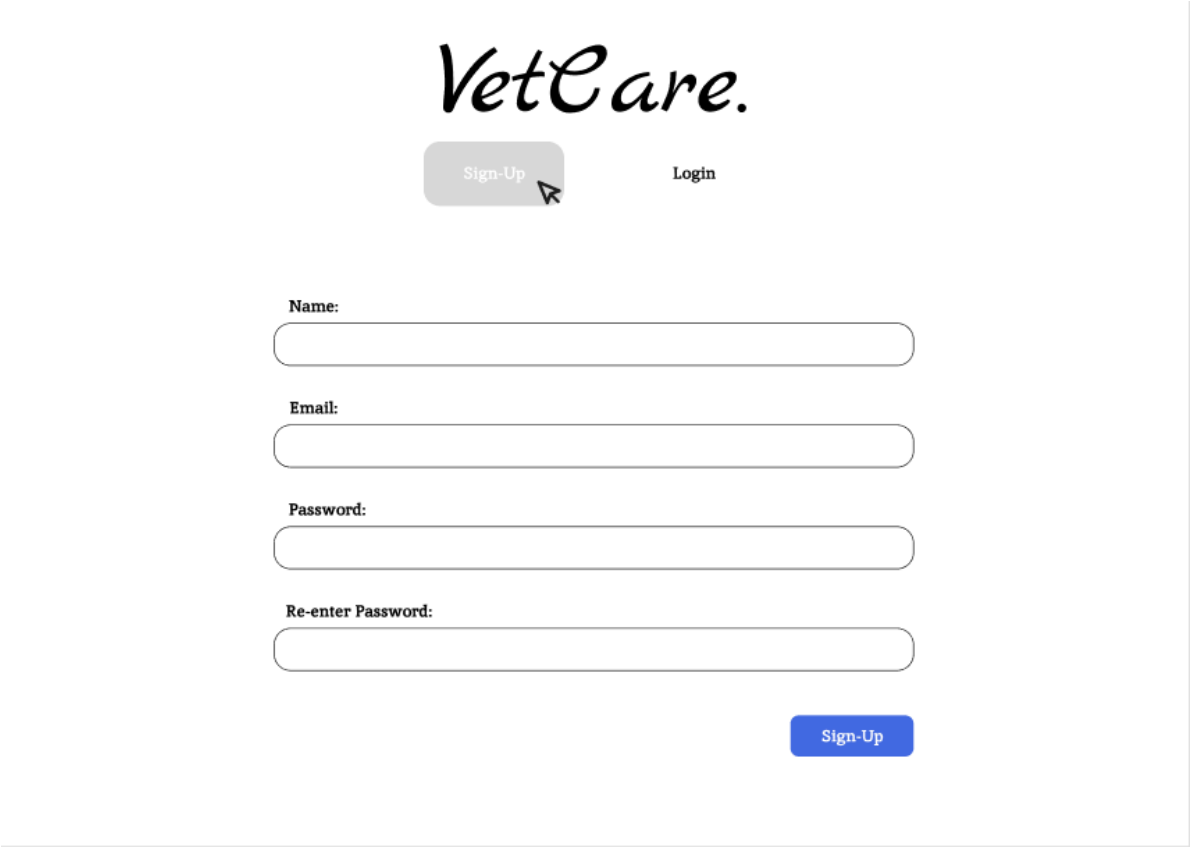


Figure 2.0 - “Make a Booking” page can be accessed by clicking the “Make a Booking” tab of the navbar.

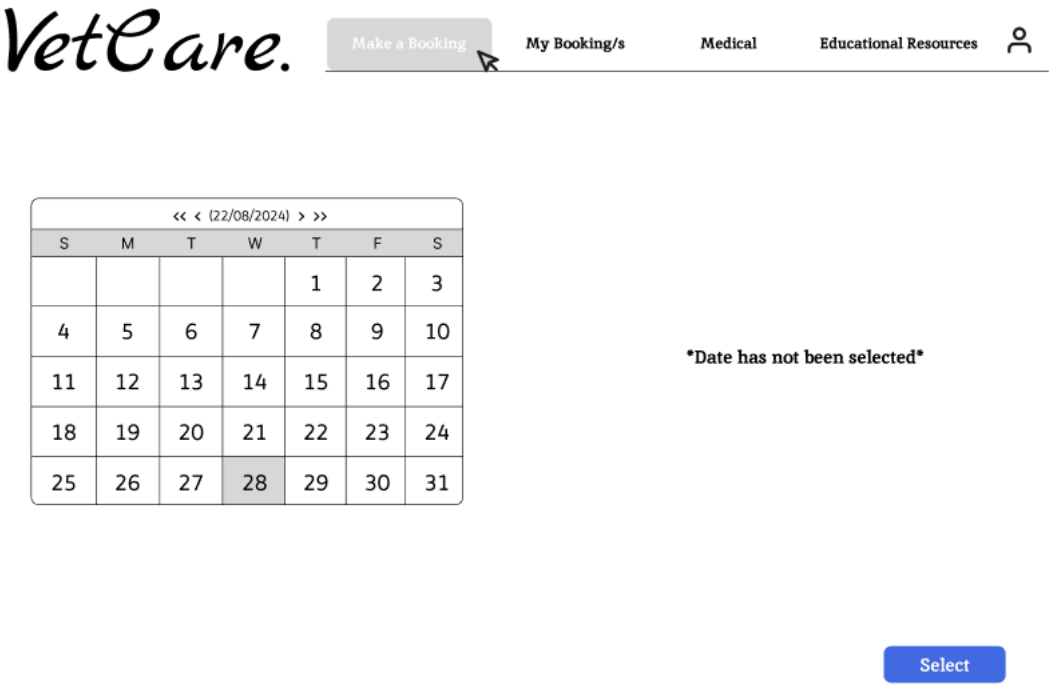


Figure 2.1 - On the “Make a Booking” page, when you select a date for your booking, available time slots will appear to be selected.

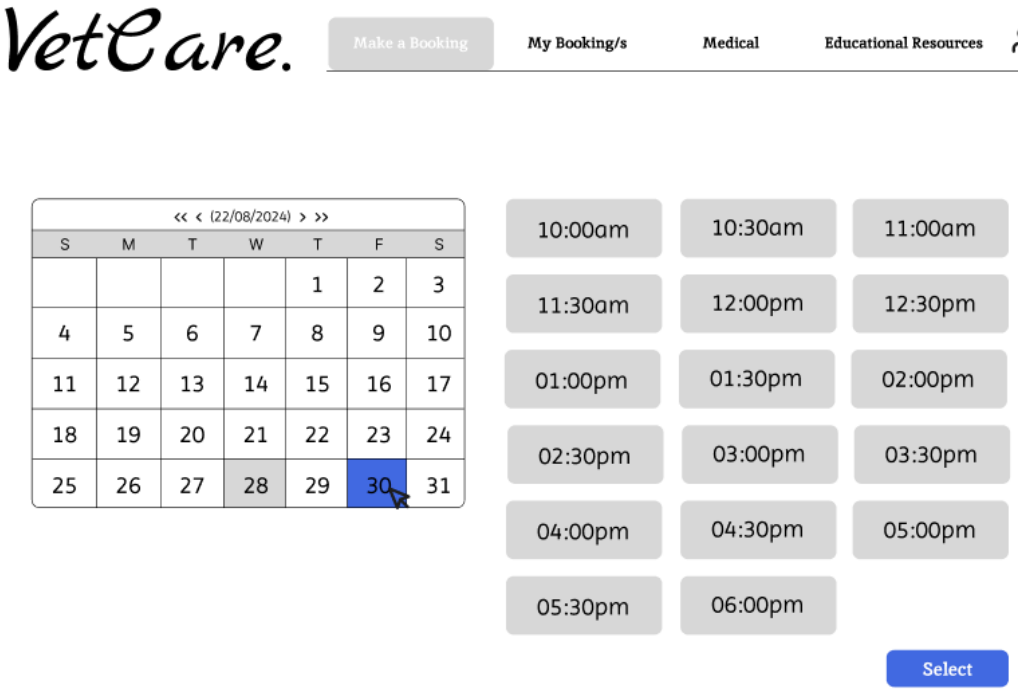


Figure 2.2 - Following a date selection, when you select a corresponding time, the time slot selected should be highlighted in blue.

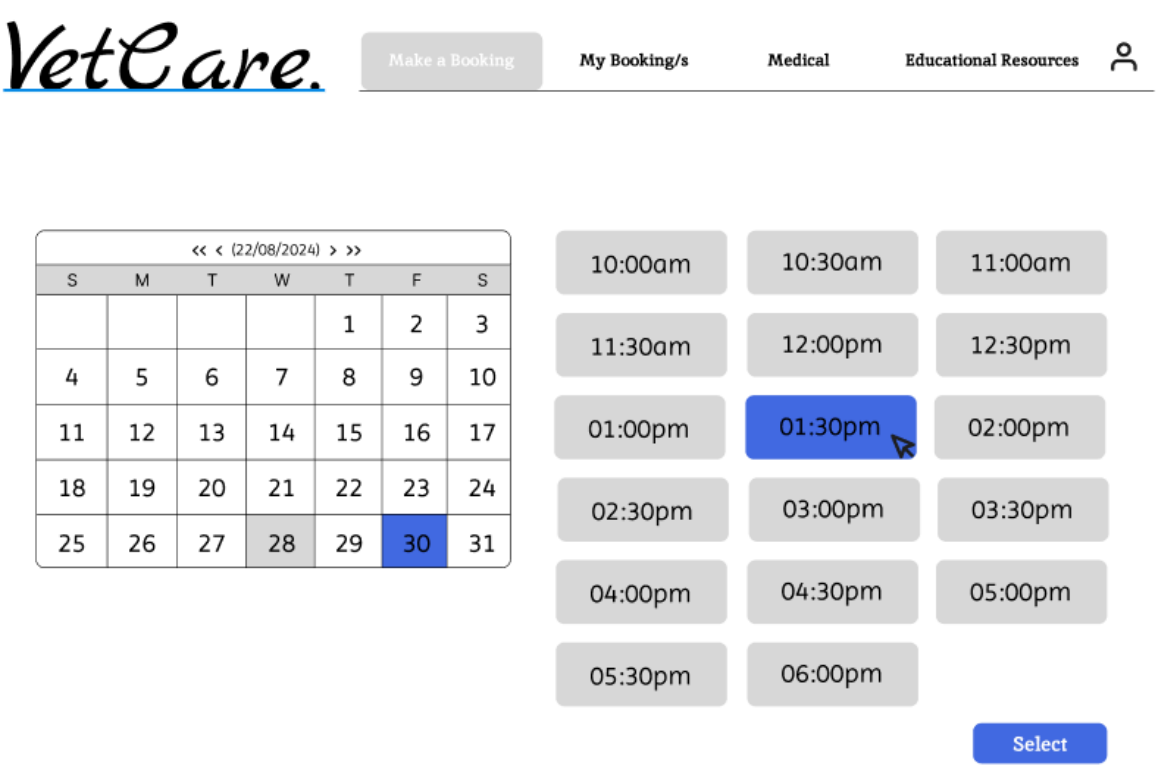


Figure 2.3 - Following clicking “Select” after specifying a date and time, a prompt will appear stating your selected agenda and will ask you to “Confirm” or to “Cancel” your booking selection.

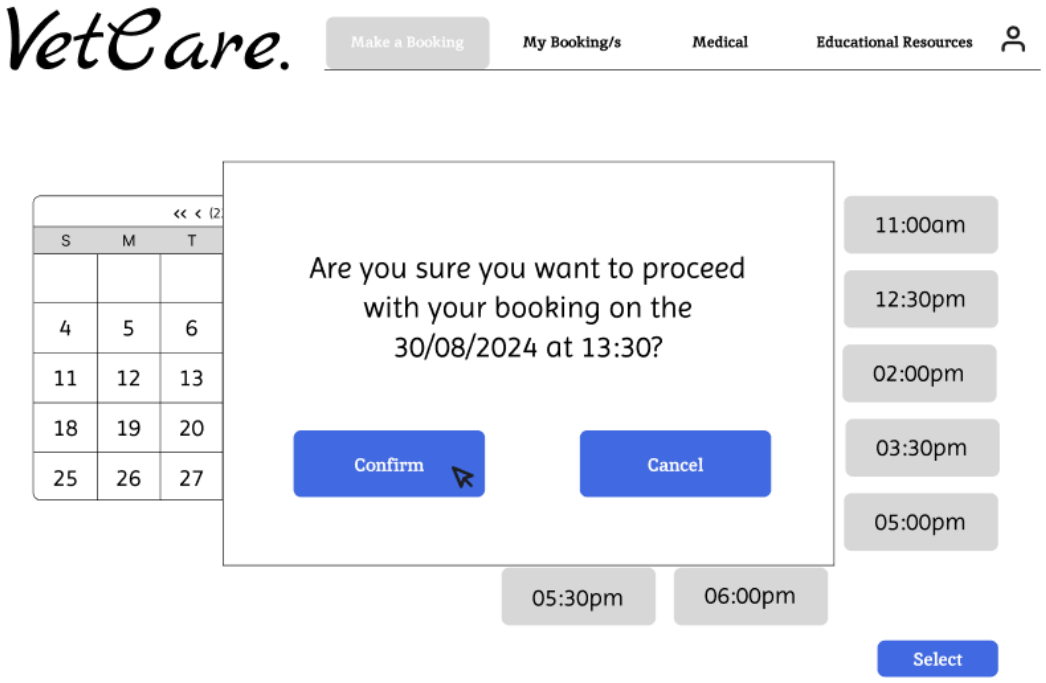


Figure 3.0 - “My Booking/s” page can be accessed by clicking the “Make a Booking” tab of the navbar. It will display the time of your upcoming and past bookings with the name of the pet you booked for as well as the agenda and Veterinarian’s name.

Figure 3.1 - To reschedule a booking, the user can click the reschedule icon which will highlight in orange when interacted with.

Figure 3.2 - Following a user clicking the reschedule icon button, the user will be prompted with a confirmation screen, where if the user were to confirm the rescheduling then they will be redirected to the “Make a Booking” page.

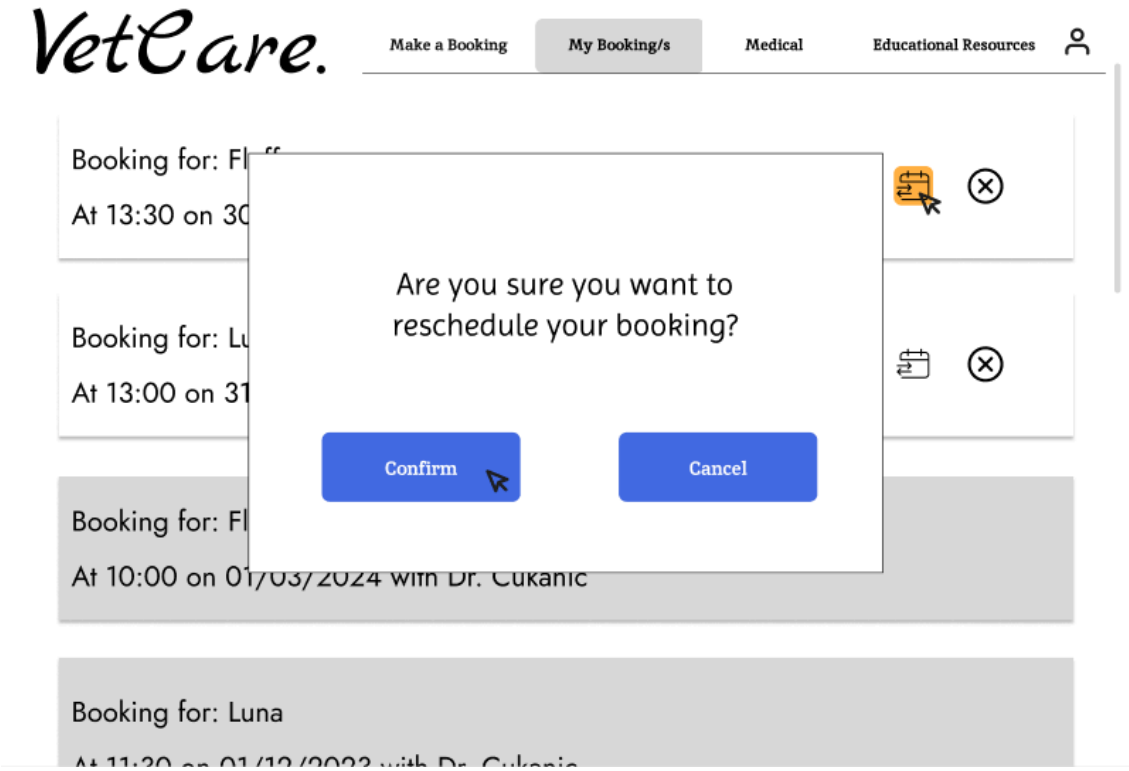


Figure 3.3 - To cancel a booking, the user can click the cancel icon which will highlight in red when interacted with.

Figure 3.4 - Following a user clicking the cancel icon button, the user will be prompted with a confirmation screen, where if the user were to confirm the cancellation then they will be directed back to the “My Booking/s” page.

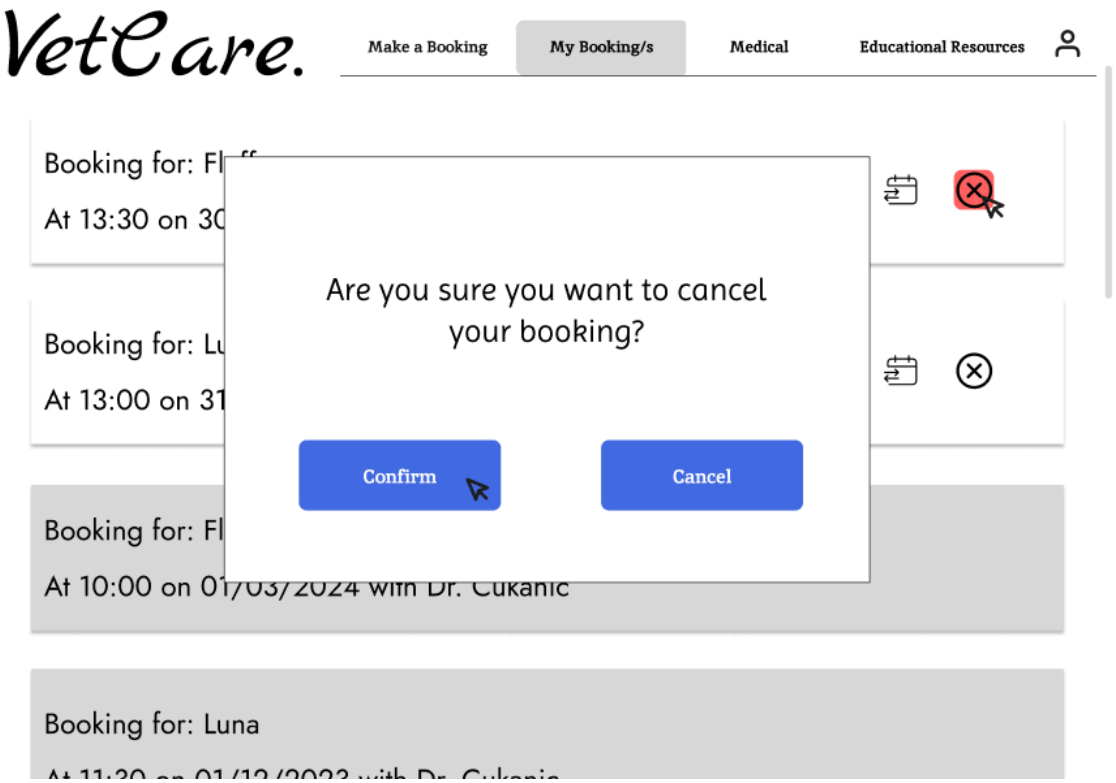


Figure 4.0 - “Medical Records” page can be accessed by clicking the “Medical” tab of the navbar, which will default you to “Medical Record” and not the “Prescriptions” page. It will display your pet/s’ name/s, sex, weight, animal type, breed, list of vaccination history and medical history.

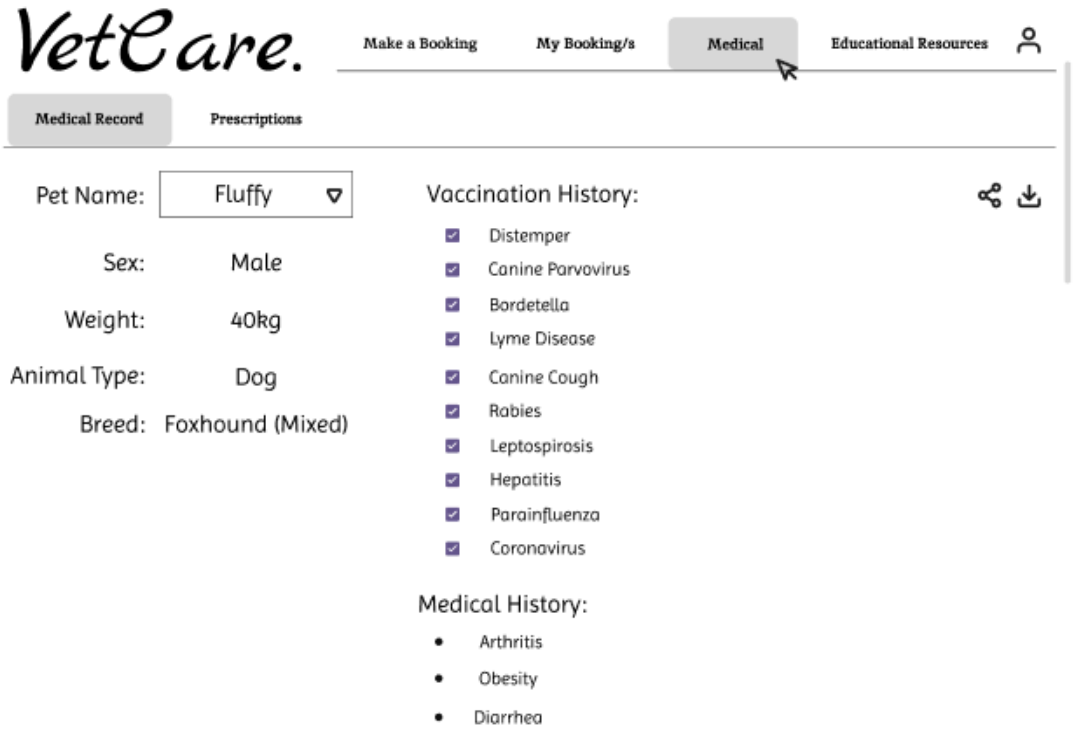


Figure 4.1 - If a user has multiple pets, when they click the down arrow next to their pet's name, it will display a list of their pets; otherwise it will just display an empty list.

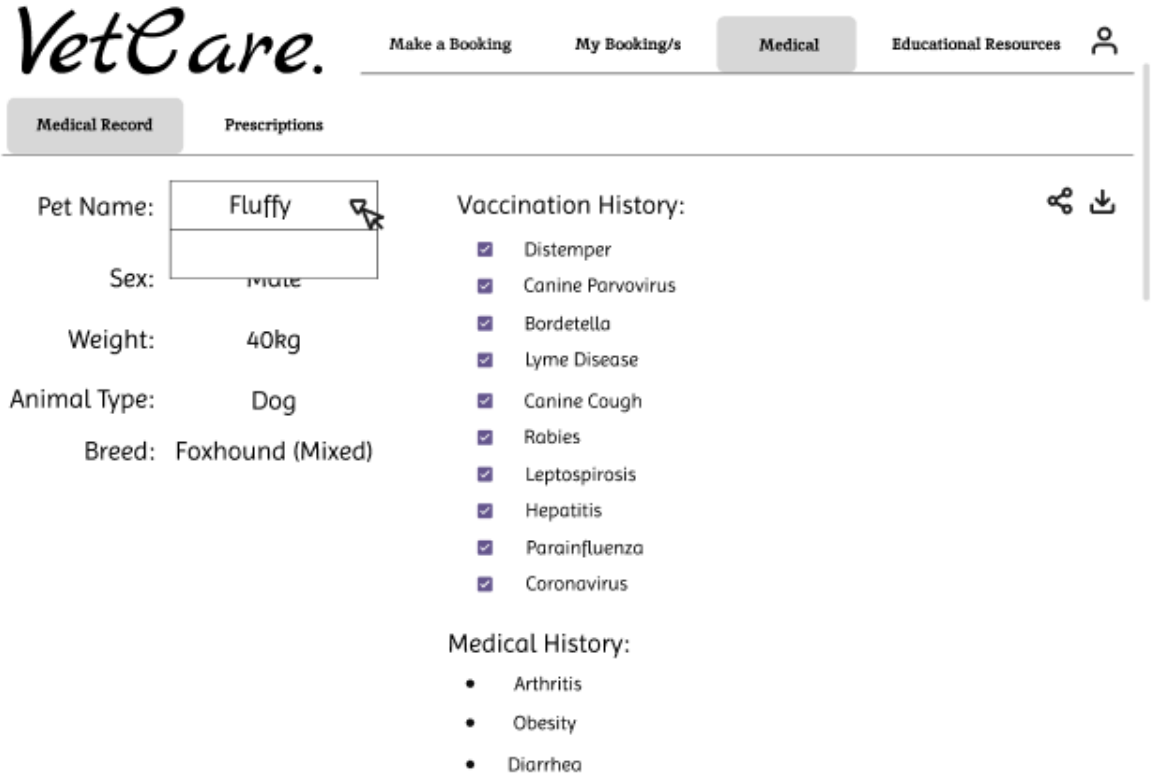


Figure 4.2 - In the top right of the "Medical Record" page, the user can click a share icon button which will display a new prompt. A user can enter an email to "Send" their selected pet's entire medical record to.

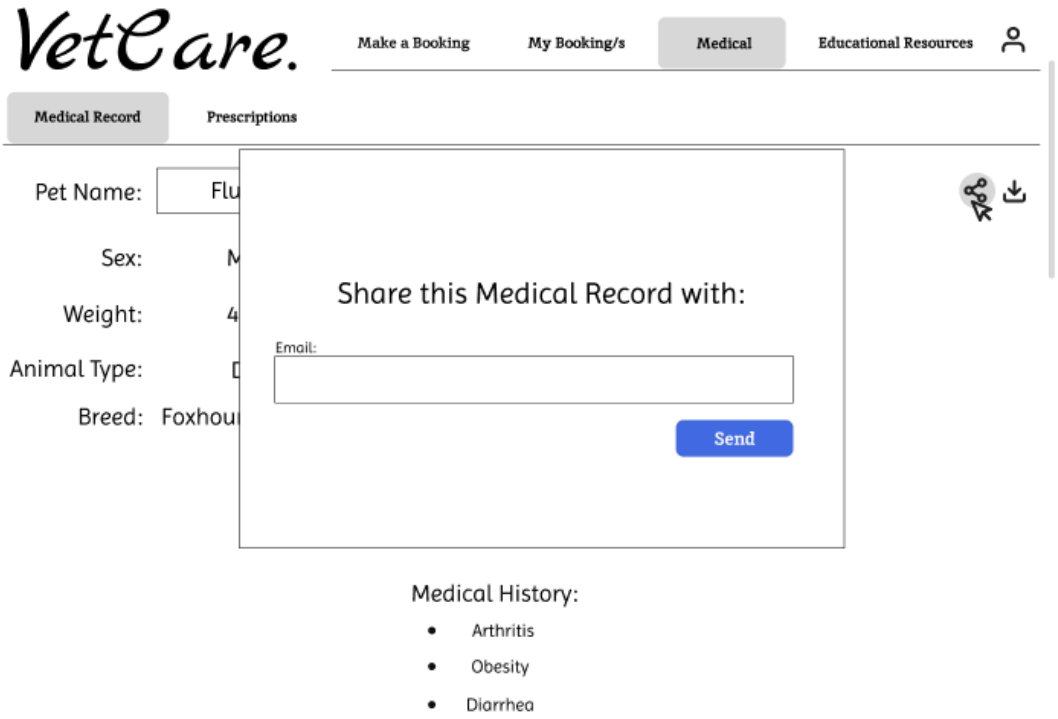


Figure 4.3 - In the top right of the “Medical Record” page, the user can click on the download icon button which will allow the user to download their selected pet’s entire medical record to their device.

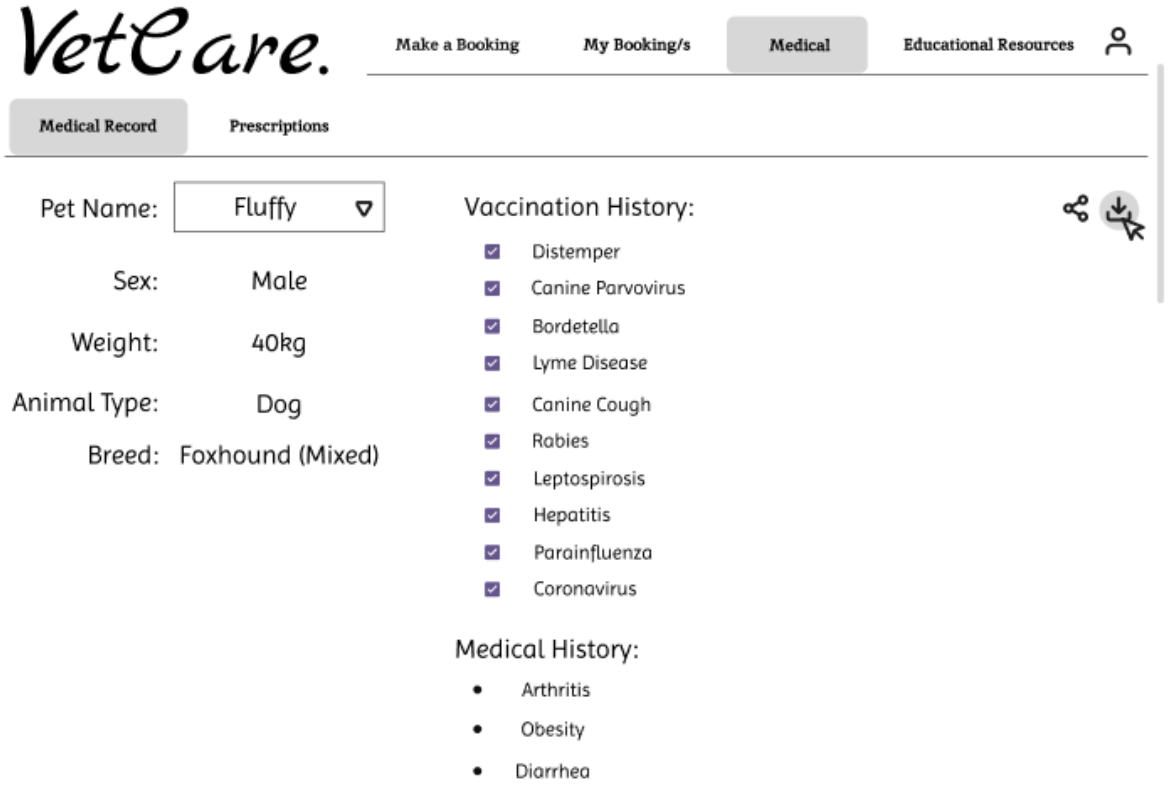
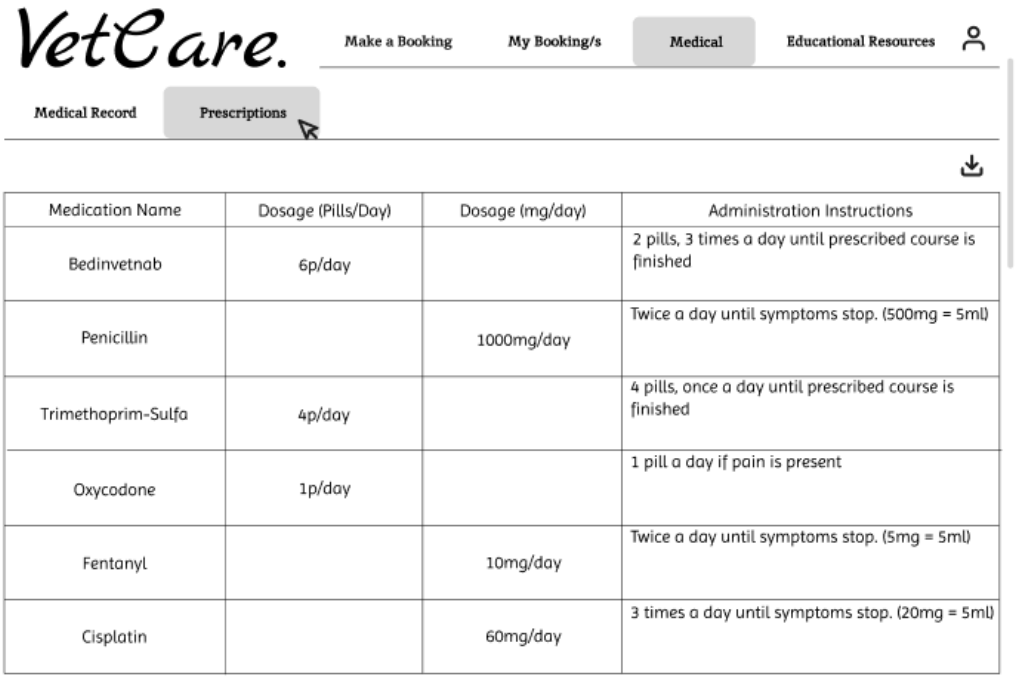


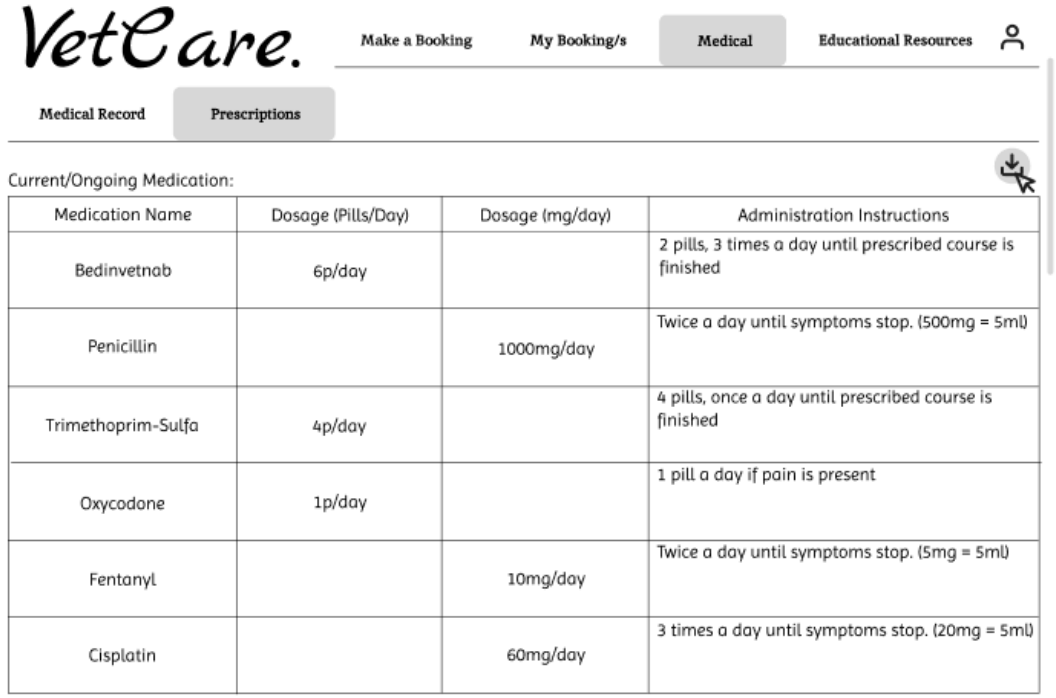
Figure 5.0 - “Prescriptions” page can be accessed by clicking the “Medical” tab of the navbar, which will default you to “Medical Record” and not the “Prescriptions” page. A user can click the “Prescriptions” secondary navbar item to be directed to the “Prescriptions”

page. This page will display all the current medication prescribed to a user's pet which will include the medication name, dosage pills/day (if pills) or dosage mg/day (if unit is mg/day), and a Veterinarian's administration instructions.



Medication Name	Dosage (Pills/Day)	Dosage (mg/day)	Administration Instructions
Bedinvetnab	6p/day		2 pills, 3 times a day until prescribed course is finished
Penicillin		1000mg/day	Twice a day until symptoms stop. (500mg = 5ml)
Trimethoprim-Sulfa	4p/day		4 pills, once a day until prescribed course is finished
Oxycodone	1p/day		1 pill a day if pain is present
Fentanyl		10mg/day	Twice a day until symptoms stop. (5mg = 5ml)
Cisplatin		60mg/day	3 times a day until symptoms stop. (20mg = 5ml)

Figure 5.1 - In the top right corner of the "Prescriptions" page there is a download icon button where when pressed will download a complete chart of a pet's current medications with all columns displayed on the website included in the PDF.



Medication Name	Dosage (Pills/Day)	Dosage (mg/day)	Administration Instructions
Bedinvetnab	6p/day		2 pills, 3 times a day until prescribed course is finished
Penicillin		1000mg/day	Twice a day until symptoms stop. (500mg = 5ml)
Trimethoprim-Sulfa	4p/day		4 pills, once a day until prescribed course is finished
Oxycodone	1p/day		1 pill a day if pain is present
Fentanyl		10mg/day	Twice a day until symptoms stop. (5mg = 5ml)
Cisplatin		60mg/day	3 times a day until symptoms stop. (20mg = 5ml)

Figure 5.2 - Scrolling down a little bit on the "Prescriptions" page, the user will be shown all of their pet's past medication that they do not take anymore.

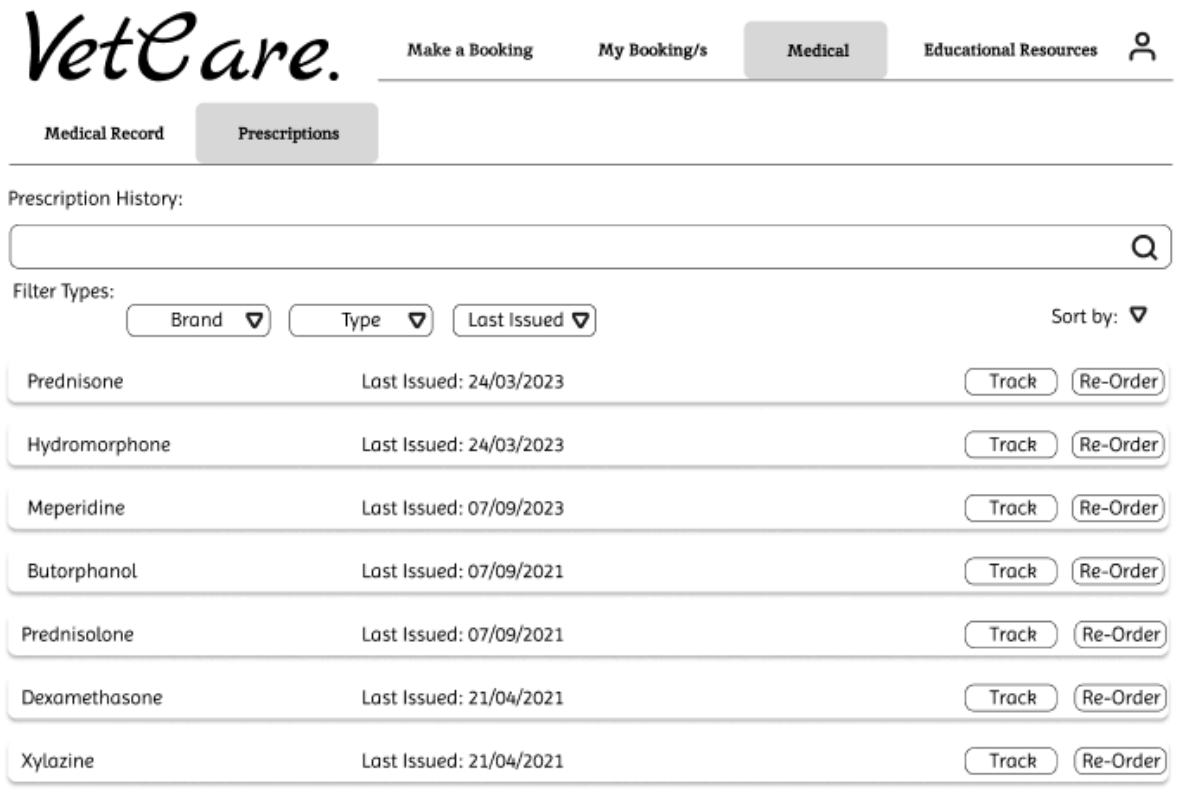


Figure 5.3 - A user can select the “Brand” filter and pick a brand to filter where the page will then only list medications of that brand.

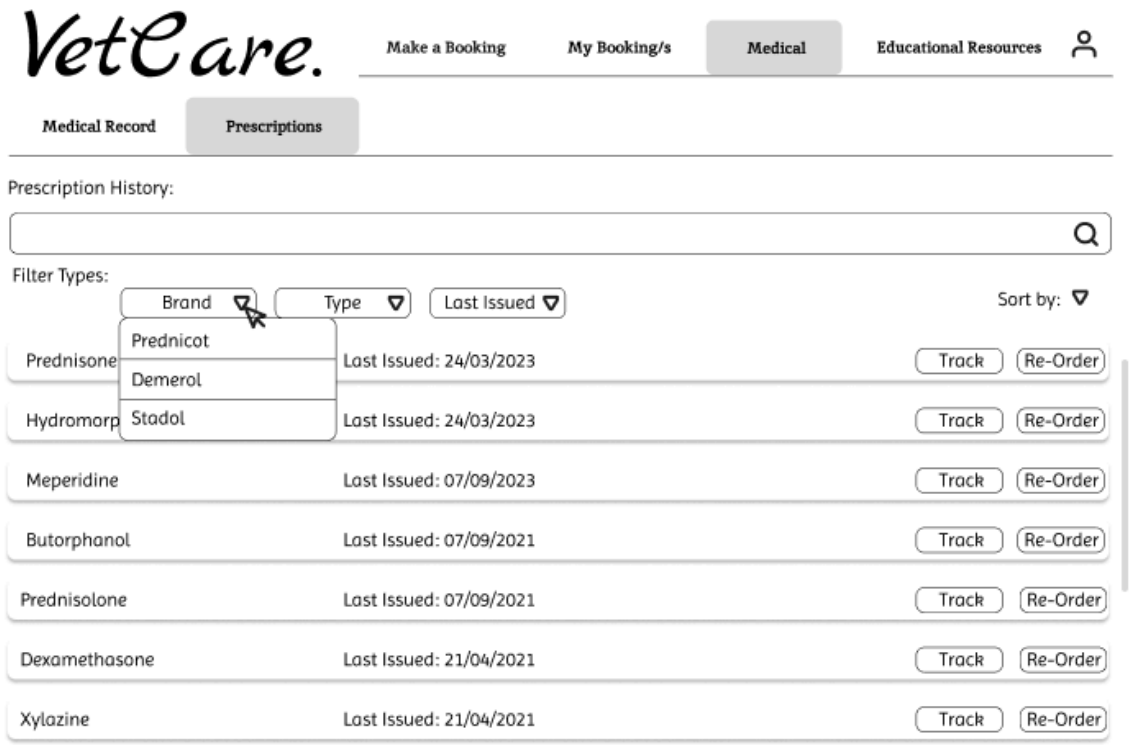


Figure 5.4 - By clicking on the “Type” filter, a user can select the type of medication to filter by i.e., pills, liquid or powder medication. The page will then list the medication depending on the type picked ;only displaying medications of that type.

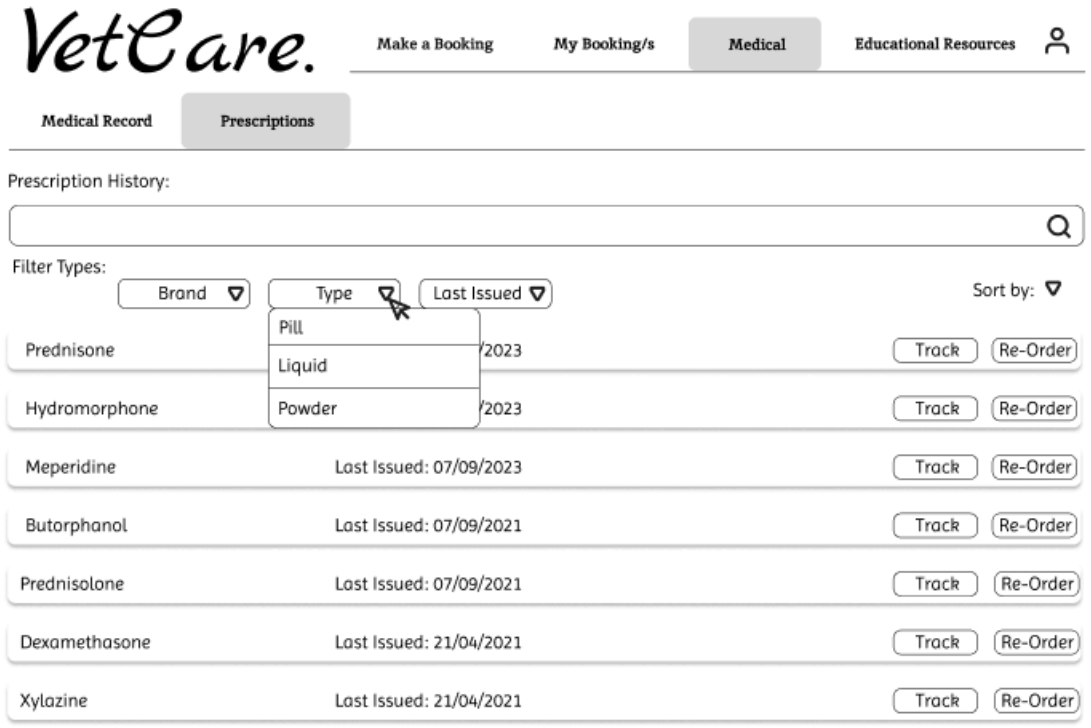


Figure 5.5 - By clicking on the “Last Issued” filter the user can filter medications based on how recent a Veterinarian has issued certain medication.

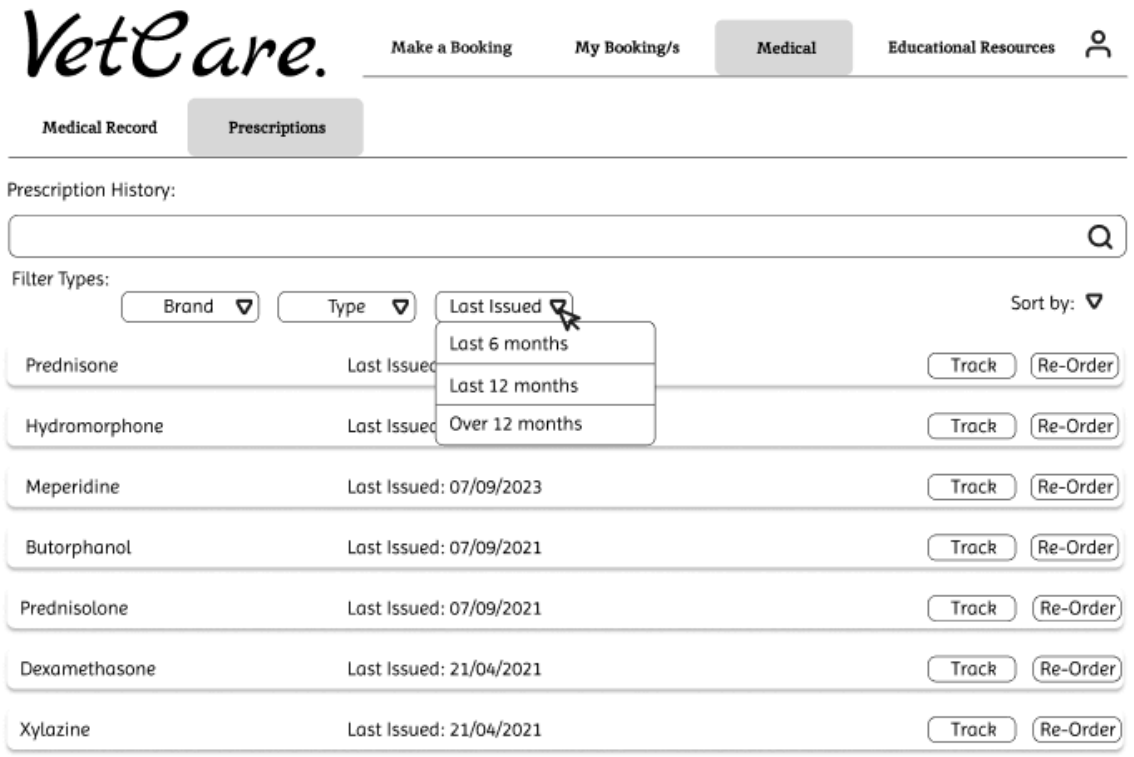


Figure 5.6 - In the top right corner of the “Prescriptions” page, a user can select to “Sort by” certain filters where the page can sort past medications based on different parameters.

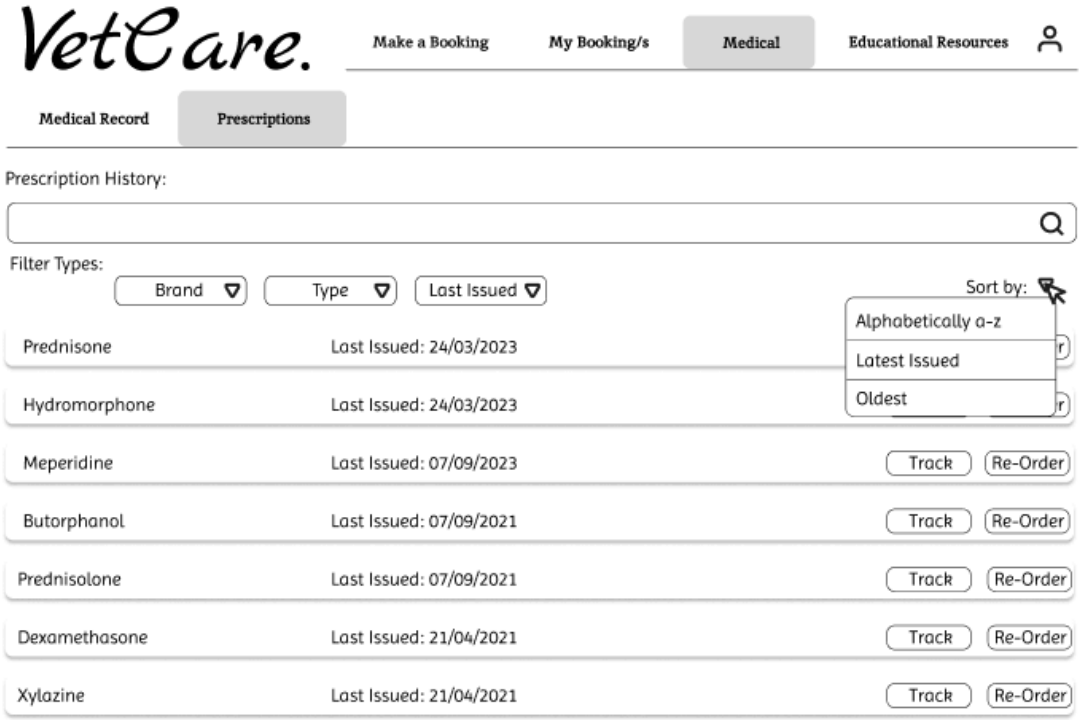


Figure 5.7 - The prescriptions history section also has search bar functionality that allows for a user to just search for a medication name from the start.

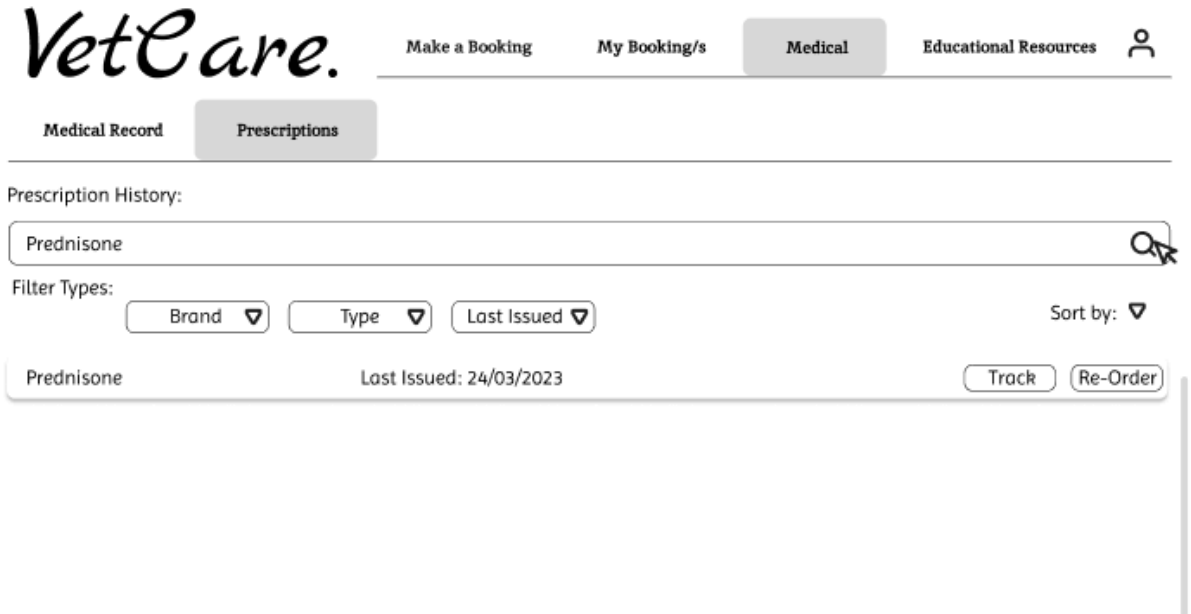


Figure 5.8 - A user can also reorder medication for their pet in their prescription history by clicking the button marked “Re-Order”. Once clicked the button will stay navy blue to signify it has been reordered while a form is sent to the relevant Veterinarian to have a prescription written for the user.

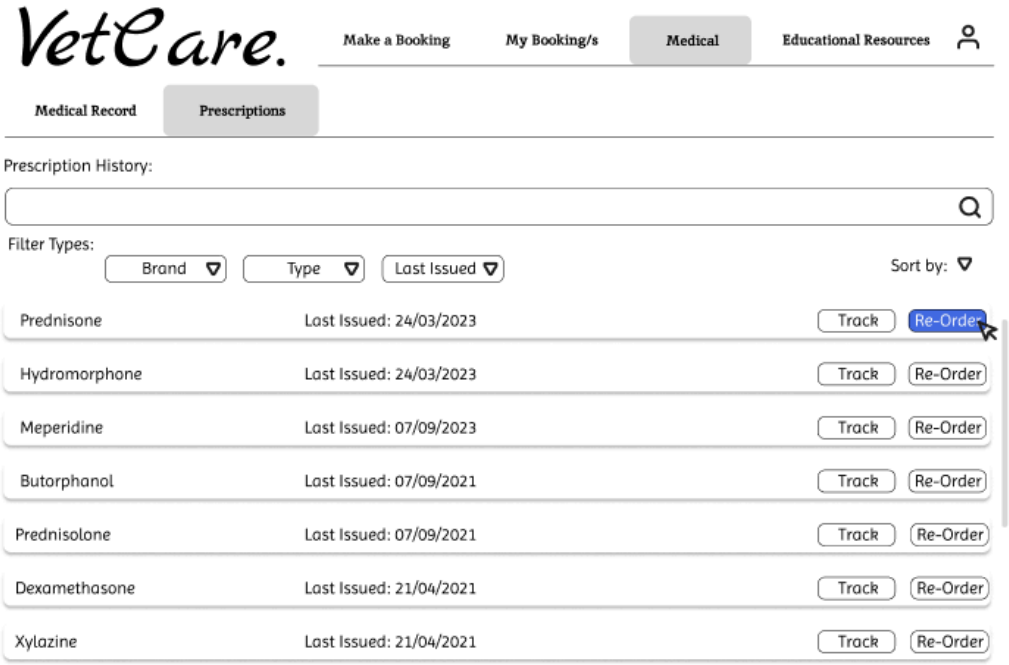


Figure 5.9 - By clicking on the “Track” button, a user can track their reorder selection, where a new item in the list will appear that displays the time left until a user can come into the clinic to pick up their pet’s prescription. The “Track” button will also appear green. The “Track” button only functions/does something when pressed if the corresponding “Re-Order” button next to it has been pressed.

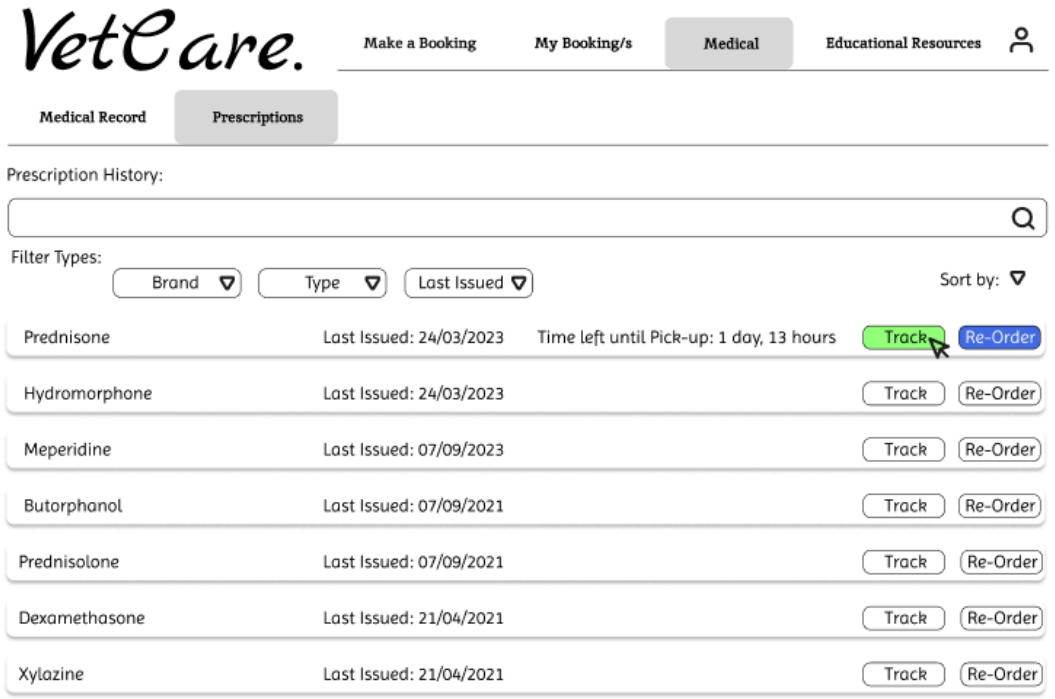


Figure 6.0 - “Educational Resources” page can be accessed by clicking the “Educational Resources” tab of the navbar. At the top of the “Educational Resources” page, the most Trending pet care videos will be listed with a relevant dot-point summary of the video next to it.

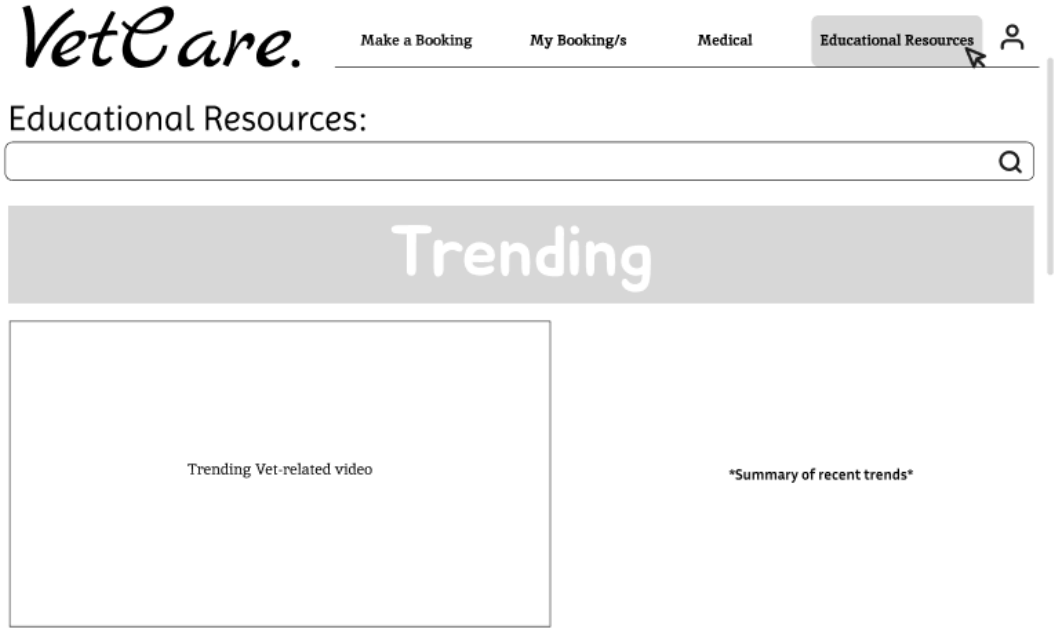


Figure 6.1 - Scrolling down, general tips and video guides on relevant pet care advice will be displayed.

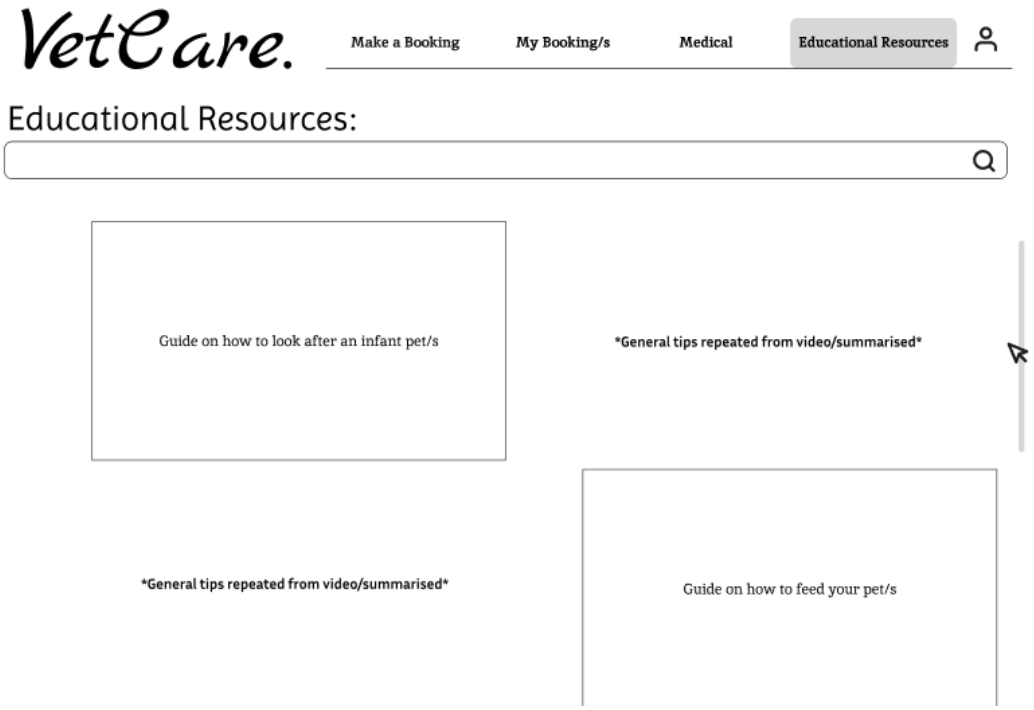


Figure 6.2 - At the very bottom of the page, relevant articles related to pet care advice and such will be posted in the form of links.